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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,339	03/01/2004	David W. Sherrer	R&H 04-02CIP	9391

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EXAMINER	
HO, TU TU V	
ART UNIT	**PAPER NUMBER**
2818	

DATE MAILED: 09/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/790,339	SHERRER, DAVID W.	
	Examiner	Art Unit	
	Tu-Tu Ho	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-10* is/are allowed.

6)☒ Claim(s) *11-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 March 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Terminal Disclaimer

1. The terminal disclaimer filed on 08/24/2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of U.S. Patent 6,698,295 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Allowable Subject Matter

2. The indicated allowability of amended claims 11-20 is withdrawn in view of the newly discovered reference(s) to Jerominek U.S. Patent 6,201,243, and in view of the new interpretation of the amended claims. Rejections based on the newly cited reference(s) follow.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitation "covers" in "where the conductive layer is disposed between the substrate and the dielectric layer" and "wherein the conductive layer contacts and covers the dielectric layer" of claim 12 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing

should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter that the applicant regards as his invention.

4. Claim 12 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 recites "where the conductive layer is disposed between the substrate and the dielectric layer" and "wherein the conductive layer contacts and covers the dielectric layer". However, there is no indication in the detailed description that the conductive layer is disposed between the substrate and the dielectric layer and the conductive layer contacts and covers the

dielectric layer, therefor said limitation "covers" does not appear to be distinct and is therefore indefinite.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 11, 13, 14, and 16-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Jerominek U.S. Patent 6,201,243 (the '243 reference).

The '243 reference discloses in the figures, particularly Fig. 22, and respective portions of the specification a micromachined apparatus as claimed.

Referring to **claim 11**, the reference discloses a micromachined apparatus comprising:

a substrate (1, Fig. 22); and

a released microstructure (22, column 3, lines 25-30) disposed on the substrate, comprising:

a dielectric layer (9, column 4, lines 49-55), and

a conductive layer (8, column 4, lines 52-58) attached to the dielectric layer (9), wherein the conductive layer has a thickness less than 1/5 the dielectric layer thickness (column 4, lines 49-58, thickness of the dielectric layers 6, 9, 12, 16 is about a fraction of 1 μm to a few μm, the thickness for the conductive layers 8 and 15 is about 0.1 μm) and wherein the conductive layer (8) is disposed between the substrate (1) and the dielectric layer (9).

Referring to **claim 17**, the microstructure 22 comprises a cantilever 22 that is attached to the substrate 1.

Referring to **claim 13**, the reference discloses a micromachined apparatus comprising:

a substrate (1, Fig. 22); and

a released microstructure (22, column 3, lines 25-30) disposed on the substrate, comprising:

a dielectric layer (6/9, column 4, lines 49-55), and

a conductive layer (8, column 4, lines 52-58) attached to the dielectric layer (6/9), wherein the conductive layer has a thickness less than 1/5 the dielectric layer thickness (column 4, lines 49-58, thickness of the dielectric layers 6, 9, 12, 16 is about a fraction of 1 μm to a few μm, the thickness for the conductive layers 8 and 15 is about 0.1 μm) and wherein the conductive layer (8) is enclosed within the dielectric layer (6/9).

Referring to **claim 14**, the reference discloses a micromachined apparatus comprising:

a substrate (1, Fig. 22); and

a released microstructure (22, column 3, lines 25-30) disposed on the substrate, comprising:

a dielectric layer (9 or 9/12, column 4, lines 49-55),

a first conductive layer (8, column 4, lines 52-58) attached to the dielectric layer (9 or 9/12), wherein the conductive layer has a thickness less than 1/5 the dielectric layer thickness (column 4, lines 49-58, thickness of the dielectric layers 6, 9, 12, 16 is about a fraction of 1 μm to a few μm, the thickness for the conductive layers 8 and 15 is about 0.1 μm) , and

a second conductive layer (15, column 4, lines 52-58) attached to the dielectric layer (9 or 9/12), and wherein the dielectric layer (9 or 9/12) is sandwiched between the conductive layers (8 and 15).

Referring to **claim 16**, the reference discloses a micromachined apparatus comprising:

a substrate (1, Fig. 22); and

a released microstructure (22, column 3, lines 25-30) disposed on the substrate, comprising:

a dielectric layer (6, or 9, or 9/12, column 4, lines 49-55) comprising a via hole (generally represented by the element that electrically connects the substrate 1 and the conductive layer 8, or by the element that electrically connects the conductive layer 8 and the conductive layer 15), and

a conductive layer (8 or 15, column 4, lines 52-58) attached to the dielectric layer (6, or 9, or 9/12), wherein the conductive layer has a thickness less than 1/5 the dielectric layer thickness (column 4, lines 49-58, thickness of the dielectric layers 6, 9, 12, 16 is about a fraction of 1 μm to a few μm, the thickness for the conductive layers 8 and 15 is about 0.1 μm).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 19-20** are rejected under 35 U.S.C. §103(a) as being unpatentable over Jerominek U.S. Patent 6,201,243 (the '243 reference) in view of Busta et al. U.S. Patent 6,140,646 (the '646 reference, cited in a previous office action).

The '243 reference discloses in the figures, particularly Fig. 22, and respective portions of the specification a micromachined apparatus substantially as claimed and as detailed above for claims 11, 13, 14, and 16, but fails to teach silicon carbide as material for the dielectric layer. Specifically, the reference discloses that the dielectric layer comprises a silicon nitride.

The '646 reference, in also disclosing a micromachined apparatus as detailed in a previous office action, including a dielectric layer 228, teaches that the dielectric layer 228 could comprises a silicon carbide or a silicon nitride (column 4, lines 30-32), thereby teachings that the two materials are art equivalents.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the '243 reference's device such that the dielectric layer comprises silicon carbide. One would have been motivated to make such a change in view of the teachings in the '646 reference that the two materials are art equivalents.

7. **Claims 11 and 13-20** are rejected under 35 U.S.C. §103(a) as being unpatentable over prior art micromachined apparatuses, for example those that disclosed by Jerominek U.S. Patent 6,201,243 (the '243 reference), detailed above and below, and by Busta et al. U.S. Patent 6,140,646 (the '646 reference), cited in a previous office action.

A prior art micromachined apparatus typically comprises, as detailed above and in a previous office action, for example, by the 243 reference and the '646 reference, a released microstructure having a multilayered layer of insulator/conductor/insulator, conductor/insulator/conductor, or combination thereof, on a substrate. The one thing a prior art micromachined apparatus may not teach is the relative thickness of the sub-layers as claimed. However, the relative thickness of the sub-layers, so far as the conductive layer being non-silicon, is deemed to be obvious because, as has been found in many instances, and as admitted by Applicant (paragraph [0025]: "Of course, the required conductivity and thickness of the conductive layer depend upon the microstructure design and its application"), a change in size is recognized as being within the level of ordinary skill in the art (MPEP 2144.04 [R-1], section IV). Prior art's conductive layer is

typically relatively thin metallic layer, such as disclosed by both the mentioned references. The same limitation, namely the relative thickness of the sub-layers in claims 1-10 and in claims 1-36 of the parent patent, has not been found to be obvious because the claimed conductive layer is a (semiconductor) polysilicon layer, which is not so conductive and not so rigid as a metallic film as is known by a person of ordinary skill in the art, and it would not have been obvious to modify the claimed semiconductor polysilicon layer so that it is as thin as claimed. By contrast, in claims 11-20, since material for the conductive layer is not specified, and since limitations from the specification are not allowed to be read into the claims, specially in the instant case the conductive material could be metal or polysilicon (present invention, paragraph [0025]), one of ordinary skill in the art would rightfully assume that the conductive layer being metallic, and metallic material, being more conductive and rigid than polysilicon, could be afforded to be thinner, for example, for the purpose of saving materials and making the final product smaller, just as disclosed by both the '243 reference and the '646 reference, as an example.

Claim Rejections § 102 & § 103

8. **Claims 15 and 18 are** rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Jerominek U.S. Patent 6,201,243 (the '243 reference).

Referring to **claim 15**, the '243 reference discloses in the figures, particularly Fig. 22, and respective portions of the specification a micromachined apparatus substantially as claimed and as detailed above for claims 11, 13, 14, and 16, including first and second conductive layers 8 and 15, but fails to teach that the first and second conductive layers 8 and 15 have equal

thickness. Nevertheless, the first and second conductive layers 8 and 15 appear to have equal thickness as clearly depicted in Fig. 22 and as because the reference does not explicitly disclose that first and second conductive layers 8 and 15 have different thicknesses.

Referring to **claim 18**, the '243 reference discloses in the figures, particularly Fig. 22, and respective portions of the specification a micromachined apparatus substantially as claimed and as detailed above for claims 11, 13, 14, and 16, including microstructure sensor 22 (column 1, lines 5-10), but fails to teach that the microstructure sensor comprises a switch. Nevertheless, the limitation "switch" appears to be inherent in the microstructure sensor so that the sensor could communicate with and transmit to other devices as to the signal that the sensor senses.

Allowable Subject Matter

9. Claims 1-10 are allowable over the prior art of record.

The following is an examiner's statement of reasons for allowance: The prior art of record fails to teach or render obvious a micromachined apparatus with all limitations as recited in claim 1, characterized in that the conductive layer is polysilicon and in the relative thickness as claimed, and as detailed above in numbered paragraph 7.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tu-Tu Ho whose telephone number is (571) 272-1778. The examiner can normally be reached on 6:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID NELMS can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tu-Tu Ho
September 11, 2005